



NASA PM Challenge 2007

Corporate Archetype Shifts:  
Implementing a  
Life Cycle and Gated Milestone  
Process

Jeff Osterkamp

Vice President, Program Management Office  
Ball Aerospace & Technologies Corp.



# Outline

- Company Background
- The Life Cycle and Gated Milestone (LCGM) Vision
- The LCGM Concept
- Implementation of the LCGM
- Effective Practices and Lessons Learned
- Current Status
- Summary and Conclusions



# Ball Aerospace & Technologies Corp.

- Celebrating 50 years in Aerospace
- Wide Range of Capabilities
  - Full space missions, spacecraft, payloads, subsystems and components
- Four Strategic Business Units
  - Serving Defense, Civil, and Commercial Aerospace Markets
- Demographics
  - Over 600 years of collective Program Management experience
  - 70+ Program Managers, many with over 20 years of experience
  - 2,989 employees with an average tenure of 9 years and average age of 45
  - 240 active programs generating \$700M/yr in sales
- Culture
  - Highly innovative, creative, and entrepreneurial



# Diverse Program & Product Environments

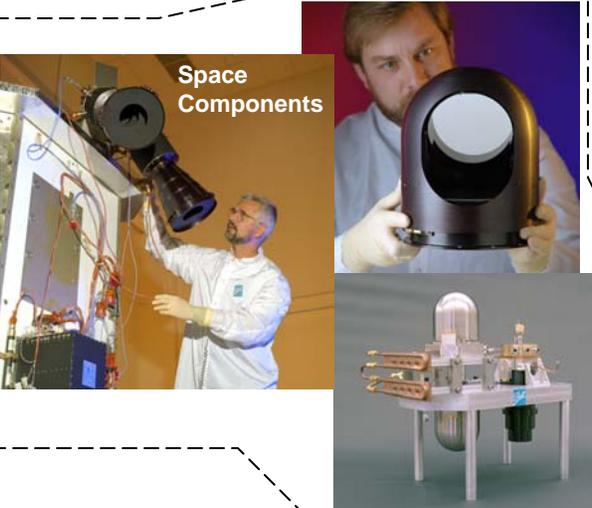
**Commercial Spacecraft & Payloads**



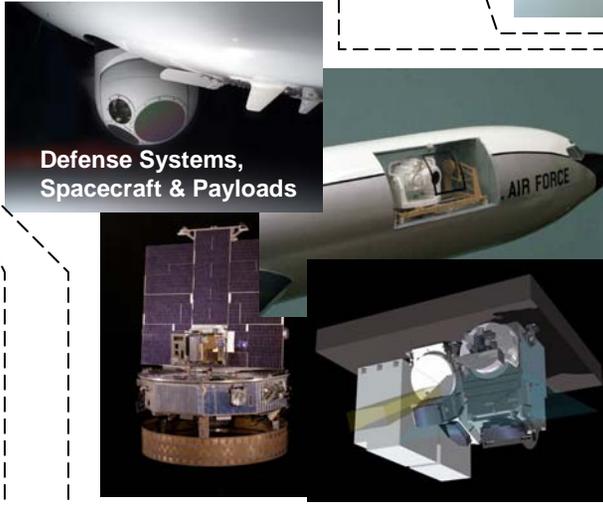
**Civil Spacecraft & Payloads**



**Space Components**



**Defense Systems, Spacecraft & Payloads**



**Tactical Components**





# Life Cycle Gated Milestone (LCGM) Vision

A new archetype aimed at improving program planning, execution, and control.

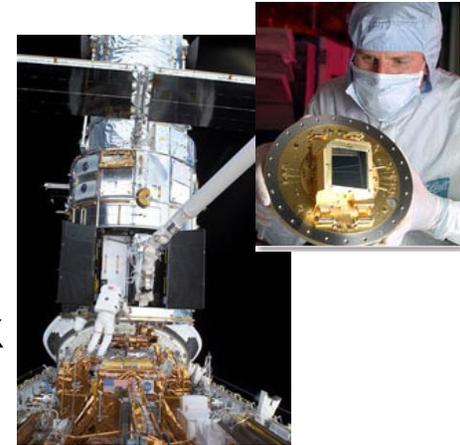


Construct and implement a LCGM process and tool to identify and align the products and processes required for pursuit and execution of programs



# LCGM - Implementation Objectives

- Provide Mapping of End-to-End Program Processes
- Clarify Process Interaction
- Improve Program Planning and Reduce Execution Risk
- Address Growth Challenges by Improving Execution Performance and Consistency
- Allow for Analysis of Waste and Streamlining Opportunities
- Show how Process Owners can Enhance the Quality of Their Products





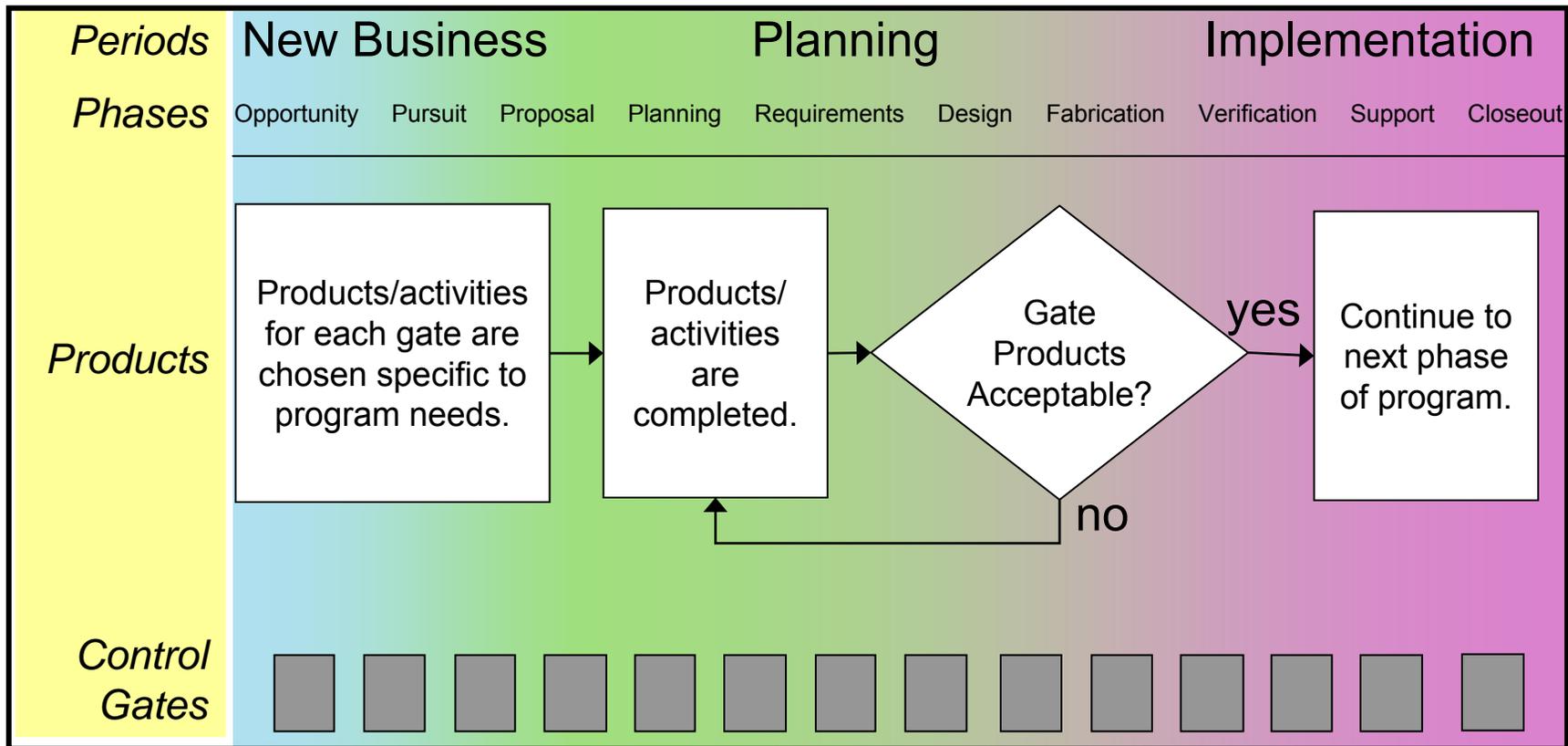
# LCGM - Implementation Concerns & Strategies

- Address the Shift from Informal to Formal Process within a Entrepreneurial Culture
- Address the Perceived Shift of Control Away from the Program Manager
- Provide a Standardized but Flexible Tool for Use Across Varied Program Environments
- Provide a Tool that Satisfies the Various Micro-Cultures in the Corporation
- Show Connection of Phased Activities Across Organizational Boundaries
- Develop a Communications Tool that Emphasizes Common Vernacular



# LCGM Conceptual Model

## Phased Product Development with Gated Review and Control

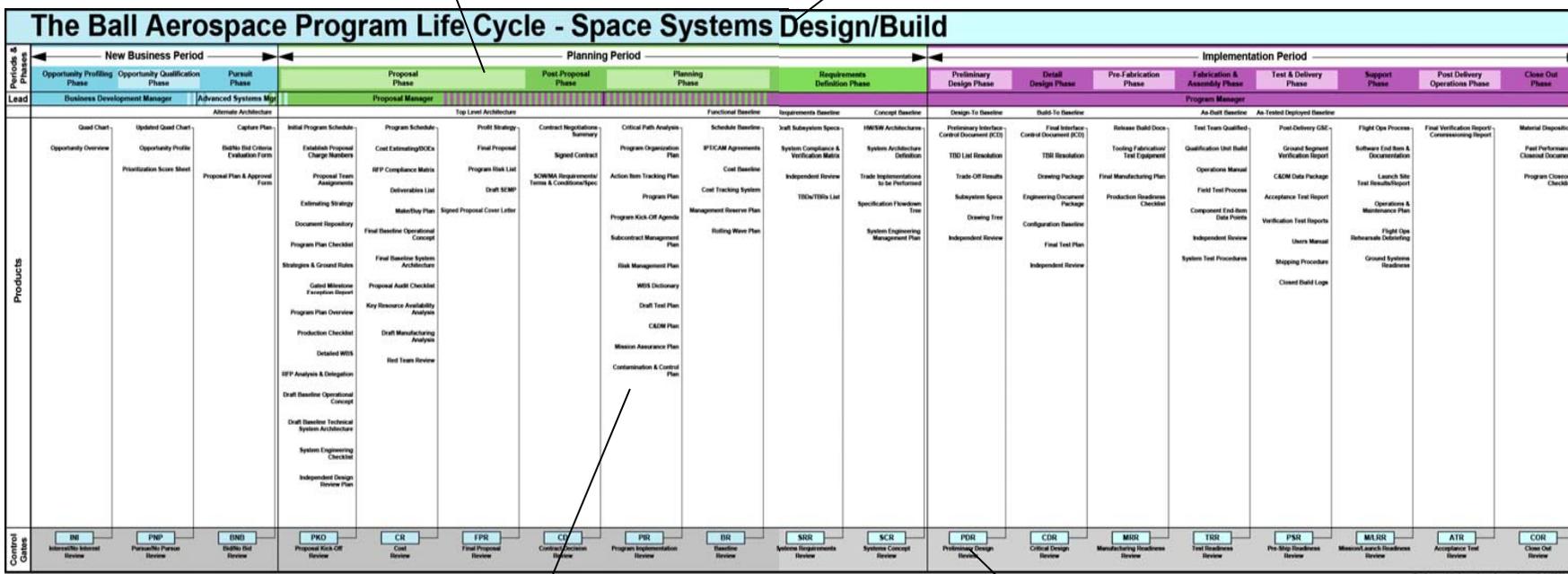




# Anatomy of the LCGM

Categorized activity, time-phased across the lifecycle

LCGM Profile defines required time-phased products and processes based on program environment



Product list tailored to fit specific program profile

Link to process, tool, template, and best-practice example

Control Gates used to assess readiness to advance

# Applied Tactics for Implementation

- Communicate Vision and Objectives
  - Executive management
  - Business units
  - Functional support organizations



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- Establish a Collaborative Working Group
  - Representation from executive management, business units, and functional support organizations
  - Weekly meetings to determine types of programs, requirements flows, maturity levels and other specifics
- Create a Graphical Model of the Life Cycle and Gate Flows
- Link to Quality Business System and Align with Other Processes
- Create a Web Tool for Easy Access and Use
- Pilot the Process Through Sample Programs
- Introduce, Train, and Communicate



## Best Practices / Lessons Learned



- Allow Sufficient Time for Development
  - Obtain **cross-functional** corporate support
  - Get stakeholder buy-in (**include users in the development process**)
  - Provide supporting tools and documents with the process
  - **Provide additional instructions** and a **dedicated** resource for questions
  - **Clearly define and enforce criteria for gate entry and exit**
  - Avoid “polishing the apple”; plan to collect feedback and evolve it
  
- Communicate Expectations as Clearly as Possible
  - Ensure vision and need are understood (**include program managers**)
  - **Communicate the expected “maturity” to users, prior to release**
  - Establish and publish a schedule of required activities
  - **Establish documentation requirements, and approval authority early**



## Best Practices / Lessons Learned



- Build in Flexibility
  - Provide tailored profiles to suit various program environments
  - Allow for scalability within the LCGM as well as within the required product and process activities to suit the company's size and types of programs
  - Have a process, template, and example for each product within the LCGM; make them easily accessible to the users
  
- Create an Implementation and Change Plan
  - Phase releases by program risk environment and maturity level
  - Identify "change-agents" and champions, and pilot through sample programs
  - Establish an awareness program and training schedule
  - Facilitate way to acquire feedback (i.e. feedback forums, web site, etc.)
  - Define change authority and configuration control methods
  
- Consider Timing
  - Establish a sense of urgency
  - Release with other collaborative activities (i.e. new program management office)
  - Avoid introducing too much process...too fast



## Current Status

- Use of the LCGM Process and Tool is Becoming Institutionalized
  - Recognized as a useful tool by program managers
  - Supports programs from new business to closeout
  - Well received by customers
  - Improvements continue
  - Communication and training continues





# Summary and Conclusions



- **Analysis of the End-to-End Program Lifecycle is a Great Exercise for any Company**
  - Aids in effective planning by clearly identifying required products / processes
  - Highlights the lack of maturity and standardization in certain areas
  
- **Integrating the Analysis with Tools and Examples Provides a Great Resource for Program Managers**
  - Build in flexibility aligned with program demographics
  - Balance the functional process owners' desire for quality and operational end users' need for streamlined processes
  
- **Match Implementation Methodology with Corporate Culture**
  - Get early buy in from stakeholders and engage corporate "champions"
  - The working team must best reflect the company's structure and cross-discipline interests
  - You most likely cannot over-communicate the Vision, Implementation Plan, or Application Instruction when introducing it into an entrepreneurial culture



# Questions

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